

Counting in Calabi-Yau Categories

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I will discuss a replacement for homotopy cardinality in situations where it is a priori ill-defined, including $\mathbb{Z}/2$ -graded dg-categories. A key ingredient are Calabi-Yau structures and their relative generalizations. As an application we obtain a Hall algebra for many pre-triangulated dg-categories for which it was previously undefined. Another application is the proof of a conjecture of Ng-Rutherford-Shende-Sivek expressing the ruling polynomial of a $\mathbb{Z}/2m$ -graded Legendrian knot (which is part of the HOMFLY polynomial if $m=1$) in terms of the homotopy cardinality of its augmentation category. All this is joint work with Mikhail Gorsky.

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